In the Claims:

1. (Currently Amended) A computer-implemented method for reconstructing topological information for a mesh for use in interactive simulation with complex vehicle models, said mesh comprising a polygonal soup of triangles with sides and vertices, said method comprising the steps of:

building vertex and edge connectivity data;

finding duplicates of vertices;

removing said duplicates of vertices ~~without decimation of non-duplicate vertices; and~~;

splitting at least one triangle into at least two new elements; and

realigning strips of triangles without common vertices.

2. (Original) The method as set forth in claim 1 wherein said step of building vertex and edge connectivity data comprises the steps of:

generating a representative index;

creating a vertex-neighbor table; and

building an edge-neighbor table.

3. (Previously Cancelled)

4. (Original) The method as recited in claim 2 wherein said step of removing duplicate vertices comprises:

searching for unconnected sides of triangles;

searching for duplicates of the vertices at the ends of said unconnected sides;

replacing all duplicate vertices with original vertices;

adding triangles connected to the duplicate vertices to said original vertices; and

rebuilding said edge-neighbor table for all triangles connected to said original vertices.

5. (Cancelled)

6. (Original) The method as set forth in claim 4 wherein said step of searching for duplicates comprises searching in said vertex-neighbor table for the closest vertex.

7. (Original) The method as set forth in claim 6 wherein said step of searching for the closest vertex comprises using an OctTree structure.

8. (Original) The method as set forth in claim 6 wherein said step of searching for the closest vertex comprises using a log2-complexity search method.

9. (Original) The method as set forth in claim 8 wherein said log2-complexity search method comprises using an OctTree structure.

10. (Currently Amended) A computer-implemented method for fixing holes in topological information for a mesh for use with interactive simulations, said mesh comprising a polygonal soup of triangles with sides and vertices, said method comprising the steps of:

building vertex and edge connectivity data;

finding duplicates of vertices;

removing said duplicates of vertices; ~~and~~

splitting at least one triangle into at least two new elements; and

realigning strips of triangles without common vertices.

11. (Original) The method as set forth in claim 10 wherein said step of building vertex and edge connectivity data comprises the steps of:

generating a representative index;

creating a vertex-neighbor table; and

building an edge-neighbor table.

12. (Original) The method as recited in claim 11 wherein said step of removing duplicate vertices comprises:

searching for unconnected sides of triangles;

searching for duplicates of the vertices at the ends of said unconnected sides;

replacing all duplicate vertices with original vertices;

adding triangles connected to the duplicate vertices to said original vertices; and

rebuilding said edge-neighbor table for all triangles connected to said original vertices.

13. (New) A computer-implemented method for fixing holes in topological information for a mesh for use with interactive simulations, said mesh comprising a polygonal soup of triangles with sides and vertices, said method comprising the steps of:

(a) building vertex and edge connectivity data comprising:

generating a representative index;

creating a vertex-neighbor table; and

building an edge-neighbor table;

(b) finding duplicates of vertices;

(c) removing said duplicates of vertices comprising:

searching for unconnected sides of triangles;

searching for duplicates of the vertices at the ends of said unconnected sides;

replacing all duplicate vertices with original vertices;

adding triangles connected to the duplicate vertices to said original vertices; and

rebuilding said edge-neighbor table for all triangles connected to said original vertices, and

(d) realigning strips of triangles without common vertices.